WHAT IS CLAIMED IS:

31. A method of geophysical exploration comprising:

imparting a plurality of modes of seismic energy into the earth's subsurface formations with a seismic energy source, each imparting of a mode of seismic energy by the seismic energy source constituting a seismic event;

detecting seismic energy from the seismic events with a plurality of seismic receivers, the seismic receivers adapted to detect seismic energy in at least two different orientations;

recording seismic traces corresponding to the detected seismic energy;

transforming the seismic energies produced by the seismic energy source to energies in a plurality of transformed modes; and

determining a volumetric image of the subsurface formations based on the transformed seismic energies and the recorded seismic traces.

32. The method of claim 31 further comprising transforming the reflected energies detected by the receivers into a plurality of seismic energies in a different coordinate system than that received.

33. The method of claim 32 wherein the seismic events detected by the receivers are transformed into modes of seismic energies corresponding to radial and tangential oriented seismic energies relative to an azimuth defined by a particular receiver detecting the seismic events and the seismic energy source.

34. The method of claim 31 wherein the step of imparting further comprises operating the seismic source in at least a first and a second directional mode.

35. The method of claim 34 wherein the at least a first and a second directional modes correspond to differently oriented types of seismic energy

36. The method of claim 31 wherein the step of transforming further comprises rotating the seismic events to a radial and tangential coordinate system with respect to an azimuth defined between any receiver detecting the seismic event and the seismic energy source.

37. The method of claim 31 wherein the step of determining is performed at least in part with any seismic event transformed to a radial and tangential coordinate system with respect to a

receiver detecting the seismic event and the seismic energy source.

38. The method of claim 31 wherein the different orientations are orthogonal to one another.

39. A method of geophysical exploration comprising:

imparting seismic energy into a subsurface formation of the earth with a plurality of modes of seismic events from a seismic energy source;

detecting each seismic event with at least one receiver, the at least one receiver adapted to detect seismic energy from a seismic event in a plurality of orientations;

transforming the plurality of modes of seismic events produced by the seismic energy source to seismic energies in plurality of transformed modes;

discriminating a plurality of orientations of detected seismic energies from the detected seismic events;

determining a volumetric image of the subsurface formation of the earth based on the transformed seismic events and the discriminated detected seismic energies.